CLAIMS

1. (original) An optical communication system comprising a first number M of fixed wavelength lasers coupled to a second number N of external modulators (N less than M) through a photonic cross-connect switch, wherein the photonic cross-connect switch is capable of routing the optical carriers of any N of the M fixed wavelength lasers to the N external modulators while maintaining the polarity of the N optical carriers routed to the N external modulators, and wherein the N external modulators are coupled to N data signals for producing N optical data streams from the N optical carriers and the N data signals.

2. (original) The optical communication system of claim 1, wherein each of the N data signals is fed to a different one of the N external modulators.

3. (original) The optical communication system of claim 1, wherein the outputs of the fixed wavelength lasers comprises optical carriers at distinct wavelengths.

4. (original) The optical communication system of claim 1, wherein the photonic cross-connect switch comprises:

at least M optical inputs coupled to the outputs of the M fixed wavelength lasers;

at least N optical outputs coupled to the inputs of the N external modulators; and

a photonic cross-connect fabric coupled to the at least M optical inputs and to the at least N optical outputs via polarization maintaining fiber for routing the optical carriers of any N of the M fixed wavelength lasers to the N external modulators.

5. (original) The optical communication system of claim 4, wherein the photonic cross-connect fabric comprises a Micro Electro Mechanical System (MEMS).

6. (original) The optical communication system of claim 4, wherein the photonic cross-connect fabric comprises a Micro Opto Electro Mechanical System (MOEMS).

7. (original) The optical communication system of claim 4, wherein the photonic cross-connect fabric comprises a bubble (champagne) optical switching system.

8. (original) The optical communication system of claim 4, wherein the photonic cross-connect fabric comprises a lithium niobate optical switching system.

9. (original) The optical communication system of claim 4, wherein the photonic cross-connect fabric comprises a liquid crystal optical switching system.

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10. (withdrawn) A photonic cross-connect device comprising at least M optical inputs coupled to at least N optical outputs (N less than M) through a photonic cross-connect fabric that is coupled to the at least M optical inputs and to the at least N optical outputs via polarization maintaining fiber and is capable of routing optical signals received over any N of M optical inputs to the N optical outputs.

11. (withdrawn) The photonic cross-connect device of claim 10, wherein the at least M optical inputs are couplable to at least M fixed wavelength lasers, and wherein the optical signals are optical carriers at distinct wavelengths.

12. (withdrawn) The photonic cross-connect device of claim 10, wherein the photonic cross-connect fabric comprises a Micro Electro Mechanical System (MEMS).

13. (withdrawn) The photonic cross-connect device of claim 10, wherein the photonic cross-connect fabric comprises a Micro Opto Electro Mechanical System (MOEMS).

14. (withdrawn) The photonic cross-connect device of claim 10, wherein the photonic cross-connect fabric comprises a bubble (champagne) optical switching system.

15. (withdrawn) The photonic cross-connect device of claim 10, wherein the photonic cross-connect fabric comprises a lithium niobate optical switching system.

16. (withdrawn) The photonic cross-connect device of claim 10, wherein the photonic cross-connect fabric comprises a liquid crystal optical switching system.

17. (original) A method for producing optical data streams in an optical communication system, the method comprising:

maintaining a first number M fixed wavelength lasers, each fixed wavelength laser having an output of a different wavelength that the other fixed wavelength lasers;

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maintaining a second number N external modulators, wherein the second number N is less than the first number M;

routing optical carriers from each of a predetermined N of the M fixed wavelength lasers to a different one of the N external modulators while maintaining the polarity of the optical carriers; and

feeding a data signal to each of the N external modulators to produce N optical data streams at N specific wavelengths.

18. (original) The method of claim 17, wherein routing of the output of each of a predetermined N of the M fixed wavelength lasers to a different one of the N external modulators comprises:

feeding the outputs of the M fixed wavelength lasers into a photonic cross-connect device that is capable of routing the optical carriers of the any N of the M fixed wavelength lasers to the N external modulators; and

configuring the photonic cross-connect device to route the predetermined N of the M fixed wavelength lasers to a different one of the N external modulators.